

ATTACHMENT TO AEP:NRC:0773Q
PROCEDURES GENERATION PACKAGE
PART III

VERIFICATION/VALIDATION
FOR
DONALD C. COOK NUCLEAR PLANT
EMERGENCY OPERATING PROCEDURES
REVISION 1
MAY 1, 1986

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EOP VERIFICATION/VALIDATION PROGRAM

1. Overview

Verification/Validation (V&V) of EOPs is the evaluation performed to determine that the actions specified in the procedure can be carried out by the operator to manage emergency conditions effectively.

This evaluation will be carried out in two phases. The first phase, Table Top Review, will address objectives that are geared toward verifying the Technical adequacy of the EOPs. The second phase, Control Room Walk-Through, will address objectives focused on the human engineering aspects of the written document's usability. Problem areas (hereafter referred to as discrepancies) identified by the V&V process will be documented, investigated, and resolved. It is the intention of D. C. Cook to perform V&V of all significant modification to the EOP's after initial implementation.

A portion of the Detailed Control Room Review effort will be performed concurrently with the V&V process to address the human engineering aspects of the EOP-operator-hardware interface.

2. OBJECTIVES

The scope of the evaluation accomplished by V&V will be defined by addressing several criteria. These criteria or objectives are presented as follows, listed under the program phase during which they are addressed:

Table Top Review

- o That the EOP's are technically correct, i.e., they accurately reflect the Technical Guidelines (including source documents and EOP Documentation Form).
- o That the EOPs are written correctly, i.e., they accurately reflect the writers guide.
- o That the language and level of information presentation in the EOP's is compatible with the minimum number, qualification, training, and experience of the operating staff.



Control Room Walk-Through (Validation)

- o That the EOPs are usable, i.e., they can be understood and followed without confusion, delays, errors, etc.
- o That there is a correspondence between the EOPs and the control room/plant hardware, i.e., control/equipment/indications that are referenced are available (inside and outside of the control room), use the same designation, use the same units of measure, and operate as specified in the EOPs.
- o That there is a high level of assurance that the EOPs will work, i.e., the procedure guides the operator in mitigating transients and accidents. NOTE: Since the D. C. Cook EOP's will be based on the generic Westinghouse Owners Group Emergency Response Guidelines (ERGs) and a generic validation has been performed on the ERGs, this criteria will not be specifically addressed. However, a selected set of plant specific EOPs will be exercised at the SNUPPS simulator in Zion, Illinois. In this way, an independent check of the generic program can be made to insure the plant specific conversion did not detract from the overall workability of the EOP's.

The EOP's chosen for simulator validation met the selection criteria which complies with the recommendations of NUREG 0700 (Section 3.4.2.2) as well as those needed to address the important areas of emergency operations (eg., event diagnosis, critical safety function monitoring, high risk event sequences, etc.) for system review and task analysis purposes. The event sequences are:

- o Spurious safety injection
- o Loss of reactor coolant (small break approximately 1" diameter)
- o Loss of reactor coolant (small break approximately 4" diameter)
- o Loss of reactor coolant (large break)
- o Loss of secondary coolant
- o Combined loss of reactor and secondary coolant
- o Steam generator tube rupture (design basis)
- o Steam generator tube rupture (multiple ruptures in one generator)
- o Anticipated transient without scram
- o Inadequate core cooling (resulting from failures in emergency core cooling system)
- o Inadequate core cooling (resulting from loss of secondary heat sink)
- o Pressurized thermal shock.

All of the event sequences above are within the capabilities and limitations of the SNUPPS simulator when programmed with D. C. Cook Plant specific software.

3. PROGRAM DESCRIPTION

Each EOP will be examined and evaluated step by step for compliance with the objectives presented above. The objectives are broken down into specific items to create a systematic checklist. In order for an objective to be satisfied, each specific item must be a characteristic of the EOP. Each objective is broken down as follows:

- o That the EOPs are technically correct, i.e., they accurately reflect the Technical Guidelines (including source documents and EOP Documentation Form).
 - Are entry conditions or symptoms correctly stated?
 - Is the arrangement and content of steps, cautions, and notes supported by information from source documents?
 - Are calculated or translated quantitative values correct?
 - Is the plant hardware identified by the EOP available for the operator to use?
- o That the EOPs are written correctly, i.e., accurately reflect the writers guide.
 - Are the EOPs legible, i.e., are graphs and tables clearly readable, is printed material visible within the borders on all pages?
 - Is the format consistent throughout the procedure set?
 - Is EOP identification complete and correct?
 - Are steps, cautions, and notes clearly and consistently presented, understandable, and distinguishable from each other?
 - Are transitions within the EOPs consistent and in compliance with the rules of referencing and branching contained in the writers guide?

- o That the language and level of information present action in the EOPs is compatible with the minimum number, qualification, training, and experience of the operating staff when walkthrough and simulator exercises are conducted with the minimum (or less) control room staff size required by D. C. Cook technical specifications.
 - Are the EOPs incompatible with shift manning levels and policies?
- o That the EOPs are usable, i.e., they can be understood and followed without confusion, delays, errors, etc.
 - Do the EOPs contain sufficient information, consistent with training, to enable the operator to properly execute the EOP instructions?
 - Does the operator comprehend the information presented in the EOPs?
- o That there is a correspondence between the procedures and the control room/plant hardware, i.e., control/equipment/indications that are referenced available (inside and outside the of control room), use the same designation, use the same units of measure, and operate as specified in the EOPs.
 - Are the EOPs compatible with plant hardware and plant response?
- o That there is a high level of assurance that the EOP's will work, i.e., the procedures guide the operator in mitigating transients and accidents.
 - Again, since the D. C. Cook plant EOP's are based on the Westinghouse Group ERG's, credit is taken for validation/verification of this objective based on the generic ERG validation. D. C. Cook will check this objective by using a selected set of plant specific procedures at the SNUPPS simulator in Zion, Illinois.

The verification and validation process shall be conducted on the entire set of Unit one EOPs. During the generation of the Unit two set of EOPs, areas where significant differences between the units resulted in different operator instructions will be noted. These areas will then be subjected to the entire verification/validation process as described above.

4. RESPONSIBILITIES

The Operations Department Superintendent (O.S.) will have the responsibility for implementing the V&V program at D. C. Cook. The Operations Department Procedure Coordinator (P.C) will have the responsibility for conducting the V&V program. Department engineers, procedure coordinator and licensed operators will take part in every facet of the process. The engineers will participate (as team member) in the table top review segment of the review. Licensed operators, both SRO and RO, will participate (as team members) in the table top review and walk through segments of the review. The Procedure Coordinator (SRO licensed) will conduct the V and V program assessment and be a team member for both the table review and control room walk through segments. In addition, when ever possible, department engineers with human factors background will participate as team members for the table top review and control room walkthrough. The review teams will be responsible for verifying objectives are met and discrepancies are documented. The Plant Nuclear Safety Review Committee (PNSRC) is responsible for final approval of the EOPs. Additional task responsibilities are as follows:

- o The P.C will train the review teams in the use of the V&V procedure.
- o The P.C. will interface with the Detailed Control-Room Design Review Coordinator.
- o The O.S. and P.C. will resolve all discrepancies. (The P.C will ensure that all resolutions are incorporated as necessary into the EOPs.)

5. DISCREPANCY IDENTIFICATION

The ultimate goal of the V&V program is to identify areas where the plant specific EOPs may deviate from the generic procedures, criteria in the writer guide, and technical guidelines, and/or plant characteristics or policies.

It is the responsibility of the review teams, through the use of the V&V procedure, to ensure that objectives are met and/or discrepancies documented. The review teams should also make recommendations to resolve discrepancies when appropriate.

6. DISCREPANCY RESOLUTION

Once a discrepancy is identified and documented, a resolution must be developed. The solution which resolves the discrepancy may take any of various forms, e.g., procedure change, increased operator training, hardware modification, etc. In all cases, the resolution will be documented.

When a change to a procedure or hardware is made to resolve a discrepancy, a determination must be made to indicate whether or not these changes should be reverified or revalidated. The criteria used to determine this will be whether or not the change has a major impact on items on the checklist. If the change had a major impact on the checklist item the area of the procedure affected by the change will be revalidated/reverified. For example, if it is determined that a setpoint is incorrect, then the new setpoint should be revalidated to ensure it meets the walk through checklist criteria which requires "instrument ranges/scales/units and tolerances" to be "consistent with the instrument values stated". Changes that have a minor impact (eg., typo's, spelling errors, etc.) on checklist items will not be revalidated/reverified.

The V&V on any given EOP will not be considered complete until all discrepancies applicable to it are resolved. Proposed changes will be evaluated for their impact on other emergency response capabilities.

7. RECORD RETENTION

All documentation forms generated during the V&V program will be considered part of the Emergency Procedures and retained in accordance with Plant Managers Instruction - 2130, Plant Records.